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EXAMINER	
MANOSKEY, JOSEPH D	
ART UNIT	**PAPER NUMBER**
2113	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/043,038	CAMPBELL ET AL.	
	Examiner	Art Unit	
	Joseph D. Manoskey	2113	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,7-14,16,18-25,27 and 29-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,7-14,16,18-25,27 and 29-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 5, 7-14, 16, 18-25, 27 and 29-33 rejected under 35 U.S.C. 103(a) as being unpatentable over Frey, Jr. et al., U.S. Patent 5,201,044, hereinafter referred to as "Frey" in view of Flemming, U.S. Patent 6,023,772.

3. Referring to claim 1, Frey teaches a file-based transaction system that includes transaction log, this is interpreted as a method for logging file system operation (See Col. 1, lines 9-12). Frey discloses the system performing file transactions using user-inaccessible software and including distributed type of transactions that includes several nodes and each server maintains its own independent log, this is seen as each server as each server has a log file that records all the information of the distributed transactions, which includes the transaction information that occurs on separate servers. This is interpreted as receiving a request to perform a file system operation at a primary server in a highly available system and making a call to an underlying file

system to perform the file system operation (See Col. 3, lines 22-43 and Col. 5, lines 53-56).

Frey teaches the use of a transaction log file to keep track of the progress of all pending transactions and the log file can be used to reconstruct in case of a failure of the system and Frey discloses the types of transactions including a distributed type of transaction that includes several nodes and each server maintains its own independent log, this is seen as each server has a log file that records all the information of the distributed transactions, which includes the transaction information that occurs on separate servers. This is interpreted as logging the file system operation to a log within a log device to facilitate recovery of the file system operation in the event of a system failure before the file system operation is committed to non-volatile storage, wherein the log device is located on a secondary server that is separate from the primary server in the highly available system and wherein the secondary server acts as a backup for the primary server (See Col. 4, line 53 to Col. 5, line 10 and Col. 5, lines 53-56).

Frey also teaches maintaining transaction data fields which can include the "new" or "modified" data so that a transaction may be "committed" before the base data being modified on the disk and commit means successful completion of the transaction, thus during a failure such a transaction would need to be repeated to be stored on the disk using the "new" or "modified" data in the transaction data field of the log, this is interpreted as wherein the file system operation includes arguments and data needed to repeat the file system operation (See Col. 5, lines 23-29 and Col. 6, lines 5-8). Frey teaches the log file spanning both volatile and non-volatile memory and nearly always

one portion of the log file will be in the processor's volatile memory, this is interpreted as wherein the locating the log in volatile memory on the secondary server facilitates recovery of the file system operation without adding delay to normal file system operations due to writes to non-volatile storage (See Frey, Col. 3, lines 31-32 and Col. 5, lines 14-16).

Frey teaches a recovery procedure that involves reading the log file, this is interpreted as upon a subsequent computer system startup examining the log within the log device (See Frey, Col. 9, lines 38-39). Frey also teaches the log file being used to reconstruct the system and all volatile memory which contains log entries is written to disk and into the log file, this is interpreted as replaying any file system operations from the log that have not been committed to non-volatile storage (See Frey, Col. 5, lines 4-7 and Col. 9, lines 50-52).

Frey does not disclose wherein locating the log on the secondary server facilitates failover to the secondary server when the primary server fails, however Frey does teach the of use a logging system which assures distributed file system consistency in the event of a system malfunction and thus provides for rapid file system recovery (See Col. 3, lines 15-20). Flemming teaches upon the failure of a primary unit, failover occurs to a secondary unit using the contents of a log to update its state (See Col. 11, lines 21-26). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the failover using logs of Flemming with the log recovery system of Frey. This would have been obvious to one of ordinary skill in the art at the time of the invention to do because the second unit takes over for the

malfunctioned primary unit, thus providing a rapid recovery (See Flemming, Col. 11, lines 21-26).

4. Referring to claim 2, Frey and Flemming disclose all the limitations (See rejection of claim 1) including the use unique identification numbers for the transactions in the log (See Frey, Col. 5, lines 34-35).

5. Referring to claim 3, Frey and Flemming teach all the limitations (See rejection of claim 1) including the use of a commit procedure, this is interpreted as freezing ongoing activity and making a call to the file system to flush memory buffers to non-volatile storage, which guarantees operations are committed to non-volatile storage and later unfreezing ongoing activity (See Col. 5, lines 23-33). Frey also teaches that all old completed transactions are discarded, this is interpreted as removing outstanding file system operations from the log (See Col. 5, lines 11-12).

6. Referring to claim 5, Frey and Flemming teach all the limitations (See rejection of claim 1) including defining the sequence of actions to be carried out in the transaction, this is interpreted as checking for dependencies between file system operations and ongoing file system operations, and if detected ensuring completion is done in an order that satisfies the dependencies (See Frey, Col. 5, lines 41-43).

7. Referring to claim 7, Frey and Flemming teach all the limitations (See rejection of claim 1) including the use unique identification numbers for the transactions in the log (See Frey, Col. 5, lines 34-35), and defining the sequence of actions to be carried out in the transaction, this is interpreted as associating the file system operation with a transaction identifier for a set of related file system operations and wherein logging the file system operation involves storing the file system operation with the transaction identifier to the log device (See Frey, Col. 5, lines 41-43).

8. Referring to claim 8, Frey and Flemming disclose all the limitations (See rejection of claim 1) including logging transactions and defining the sequence of actions to be carried out in the transaction, (See Frey, Col. 5, lines 3-4 and lines 41-43). This is interpreted as determining if the file system operation belongs to a subset of file system operations that are subject to logging and if so, logging the file system operation.

9. Referring to claim 9, Frey and Flemming teach all the limitations (See rejection of claim 8) including subset including operations such as parity update (See Frey, Col. 5, lines 41-43). A parity update will be deferent every time you perform the operation because the data is different, this is interpreted as the operation being non-idempotent.

10. Referring to claims 10 and 11, Frey and Flemming teach all the limitations (See rejection of claim1) including the log file spanning both volatile and non-volatile memory (See Frey, Col. 3, lines 31-32).

11. Referring to claim 12, Frey teaches a file-based transaction system that includes a transaction log and software for performing the system, this is interpreted as a computer-readable storage medium storing instructions when executed by a computer to perform a method for logging file system operation, wherein the computer-readable storage medium includes one of a volatile memory, a non-volatile memory, a disk drive, a magnetic tape, a compact disc, a digital versatile disc, and a digital video disk (See Col. 1, lines 9-12). Frey discloses the system performing file transactions using user-inaccessible software and Frey discloses the types of transactions including a distributed type of transaction that includes several nodes and each server maintains its own independent log, this is seen as each server has a log file that records all the information of the distributed transactions, which includes the transaction information that occurs on separate servers. This is interpreted as receiving a request to perform a file system operation at a primary server in a highly available system and making a call to an underlying file system to perform the file system operation (See Col. 3, lines 22-43 and Col. 5, lines 53-56).

Frey teaches the use of a transaction log file to keep track of the progress of all pending transactions and the log file can be used to reconstruct in case of a failure of the system and Frey discloses the types of transactions including a distributed type of transaction that includes several nodes and each server maintains its own independent log, this is seen as each server has a log file that records all the information of the distributed transactions, which includes the transaction information that occurs on

separate servers. This is interpreted as logging the file system operation to a log within a log device to facilitate recovery of the file system operation in the event of a system failure before the file system operation is committed to non-volatile storage, wherein the log device is located on a secondary server that is separate from the primary server in the highly available system and wherein the secondary server acts as a backup for the primary server (See Col. 4, line 53 to Col. 5, line 10 and Col. 5, lines 53-56). Frey also teaches maintaining transaction data fields which can include the "new" or "modified" data so that a transaction may be "committed" before the base data being modified on the disk and commit means successful completion of the transaction, thus during a failure such a transaction would need to be repeated to be stored on the disk using the "new" or "modified" data in the transaction data field of the log, this is interpreted as wherein the file system operation includes arguments and data needed to repeat the file system operation (See Col. 5, lines 23-29 and Col. 6, lines 5-8).

Frey teaches the log file spanning both volatile and non-volatile memory and nearly always one portion of the log file will be in the processor's volatile memory, this is interpreted as wherein the locating the log in volatile memory on the secondary server facilitates recovery of the file system operation without adding delay to normal file system operations due to writes to non-volatile storage (See Frey, Col. 3, lines 31-32 and Col. 5, lines 14-16).

Frey teaches a recovery procedure that involves reading the log file, this is interpreted as upon a subsequent computer system startup examining the log within the log device (See Frey, Col. 9, lines 38-39). Frey also teaches the log file being used to

reconstruct the system and all volatile memory which contains log entries is written to disk and into the log file, this is interpreted as replaying any file system operations from the log that have not been committed to non-volatile storage (See Frey, Col. 5, lines 4-7 and Col. 9, lines 50-52).

Frey does not disclose wherein locating the log on the secondary server facilitates failover to the secondary server when the primary server fails, however Frey does teach the of use a logging system which assures distributed file system consistency in the event of a system malfunction and thus provides for rapid file system recovery (See Col. 3, lines 15-20). Flemming teaches upon the failure of a primary unit, failover occurs to a secondary unit using the contents of a log to update its state (See Col. 11, lines 21-26). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the failover using logs of Flemming with the log recovery system of Frey. This would have been obvious to one of ordinary skill in the art at the time of the invention to do because the second unit takes over for the malfunctioned primary unit, thus providing a rapid recovery (See Flemming, Col. 11, lines 21-26).

12. Referring to claim 13, Frey and Flemming disclose all the limitations (See rejection of claim 12) including the use unique identification numbers for the transactions in the log (See Frey, Col. 5, lines 34-35).

13. Referring to claim 14, Frey and Flemming teach all the limitations (See rejection of claim 12) including the use of a commit procedure, this is interpreted as freezing ongoing activity and making a call to the file system to flush memory buffers to non-volatile storage, which guarantees operations are committed to non-volatile storage and later unfreezing ongoing activity (See Frey, Col. 5, lines 23-33). Frey also teaches that all old completed transactions are discarded, this is interpreted as removing outstanding file system operations from the log (See Col. 5, lines 11-12).

14. Referring to claim 16, Frey and Flemming teach all the limitations (See rejection of claim 12) including defining the sequence of actions to be carried out in the transaction, this is interpreted as checking for dependencies between file system operations and ongoing file system operations, and if detected ensuring completion is done in an order that satisfies the dependencies (See Frey, Col. 5, lines 41-43).

15. Referring to claim 18, Frey and Flemming teach all the limitations (See rejection of claim 12) including the use unique identification numbers for the transactions in the log (See Frey, Col. 5, lines 34-35), and defining the sequence of actions to be carried out in the transaction, this is interpreted as associating the file system operation with a transaction identifier for a set of related file system operations and wherein logging the file system operation involves storing the file system operation with the transaction identifier to the log device (See Frey, Col. 5, lines 41-43).

16. Referring to claim 19, Frey and Flemming disclose all the limitations (See rejection of claim 12) including logging transactions and defining the sequence of actions to be carried out in the transaction, (See Frey, Col. 5, lines 3-4 and lines 41-43). This is interpreted as determining if the file system operation belongs to a subset of file system operations that are subject to logging and if so, logging the file system operation.

17. Referring to claim 20, Frey and Flemming teach all the limitations (See rejection of claim 19) including subset including operations such as parity update (See Frey, Col. 5, lines 41-43). A parity update will be deferent every time you perform the operation because the data is different, this is interpreted as the operation being non-idempotent.

18. Referring to claims 21 and 22, Frey and Flemming teach all the limitations (See rejection of claim 12) including the log file spanning both volatile and non-volatile memory (See Frey, Col. 3, lines 31-32).

19. Referring to claim 23, Frey teaches a file-based transaction system that includes a transaction log (See Col. 1, lines 9-12). Frey discloses the system performing file transactions using user-inaccessible software and including distributed type of transactions that includes several nodes and each server maintains its own independent log, this is seen as each server as each server has a log file that records all the information of the distributed transactions, which includes the transaction information

that occurs on separate servers. This is interpreted as receiving a request to perform a file system operation at a primary server in a highly available system and making a call to an underlying file system to perform the file system operation (See Col. 3, lines 22-43 and Col. 5, lines 53-56).

Frey teaches the use of a transaction log file to keep track of the progress of all pending transactions and the log file can be used to reconstruct in case of a failure of the system and Frey discloses the types of transactions including a distributed type of transaction that includes several nodes and each server maintains its own independent log, this is seen as each server has a log file that records all the information of the distributed transactions, which includes the transaction information that occurs on separate servers. This is interpreted as logging the file system operation to a log within a log device to facilitate recovery of the file system operation in the event of a system failure before the file system operation is committed to non-volatile storage, wherein the log device is located on a secondary server that is separate from the primary server in the highly available system and wherein the secondary server acts as a backup for the primary server (See Col. 4, line 53 to Col. 5, line 10 and Col. 5, lines 53-56).

Frey also teaches maintaining transaction data fields which can include the “new” or “modified” data so that a transaction may be “committed” before the base data being modified on the disk and commit means successful completion of the transaction, thus during a failure such a transaction would need to be repeated to be stored on the disk using the “new” or “modified” data in the transaction data field of the log, this is interpreted as wherein the file system operation includes arguments and data needed to

repeat the file system operation (See Col. 5, lines 23-29 and Col. 6, lines 5-8). Frey teaches the log file spanning both volatile and non-volatile memory and nearly always one portion of the log file will be in the processor's volatile memory, this is interpreted as wherein the locating the log in volatile memory on the secondary server facilitates recovery of the file system operation without adding delay to normal file system operations due to writes to non-volatile storage (See Frey, Col. 3, lines 31-32 and Col. 5, lines 14-16).

Frey teaches a recovery procedure that involves reading the log file, this is interpreted as upon a subsequent computer system startup examining the log within the log device (See Frey, Col. 9, lines 38-39). Frey also teaches the log file being used to reconstruct the system and all volatile memory which contains log entries is written to disk and into the log file, this is interpreted as replaying any file system operations from the log that have not been committed to non-volatile storage (See Frey, Col. 5, lines 4-7 and Col. 9, lines 50-52).

Frey does not disclose wherein locating the log on the secondary server facilitates failover to the secondary server when the primary server fails, however Frey does teach the of use a logging system which assures distributed file system consistency in the event of a system malfunction and thus provides for rapid file system recovery (See Col. 3, lines 15-20). Flemming teaches upon the failure of a primary unit, failover occurs to a secondary unit using the contents of a log to update its state (See Col. 11, lines 21-26). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the failover using logs of Flemming with the log

recovery system of Frey. This would have been obvious to one of ordinary skill in the art at the time of the invention to do because the second unit takes over for the malfunctioned primary unit, thus providing a rapid recovery (See Flemming, Col. 11, lines 21-26).

20. Referring to claim 24, Frey and Flemming disclose all the limitations (See rejection of claim 23) including the use unique identification numbers for the transactions in the log (See Frey, Col. 5, lines 34-35).

21. Referring to claim 25, Frey and Flemming teach all the limitations (See rejection of claim 23) including the use of a commit procedure, this is interpreted as freezing ongoing activity and making a call to the file system to flush memory buffers to non-volatile storage, which guarantees operations are committed to non-volatile storage and later unfreezing ongoing activity (See Frey, Col. 5, lines 23-33). Frey also teaches that all old completed transactions are discarded, this is interpreted as removing outstanding file system operations from the log (See Col. 5, lines 11-12).

22. Referring to claim 27, Frey and Flemming teach all the limitations (See rejection of claim 23) including defining the sequence of actions to be carried out in the transaction, this is interpreted as checking for dependencies between file system operations and ongoing file system operations, and if detected ensuring completion is done in an order that satisfies the dependencies (See Frey, Col. 5, lines 41-43).

23. Referring to claim 29, Frey and Flemming teach all the limitations (See rejection of claim 23) including the use unique identification numbers for the transactions in the log (See Frey, Col. 5, lines 34-35), and defining the sequence of actions to be carried out in the transaction, this is interpreted as associating the file system operation with a transaction identifier for a set of related file system operations and wherein logging the file system operation involves storing the file system operation with the transaction identifier to the log device (See Frey, Col. 5, lines 41-43).

24. Referring to claim 30, Frey and Flemming disclose all the limitations (See rejection of claim 23) including logging transactions and defining the sequence of actions to be carried out in the transaction, (See Frey, Col. 5, lines 3-4 and lines 41-43). This is interpreted as determining if the file system operation belongs to a subset of file system operations that are subject to logging and if so, logging the file system operation.

25. Referring to claim 31, Frey and Flemming teach all the limitations (See rejection of claim 30) including subset including operations such as parity update (See Frey, Col. 5, lines 41-43). A parity update will be deferent every time you perform the operation because the data is different, this is interpreted as the operation being non-idempotent.

26. Referring to claims 32 and 33, Frey and Flemming teach all the limitations (See rejection of claim 23) including the log file spanning both volatile and non-volatile memory (See Frey, Col. 3, lines 31-32).

Response to Arguments

27. Applicant's arguments filed 16 June 2006 have been fully considered but they are not persuasive. The Applicant argues that Frey and Flemming do not teach storing the log in volatile memory of the secondary server. The Examiner respectfully disagrees. Frey teaches the log file spanning both volatile and non-volatile memory and nearly always one portion of the log file will be in the processor's volatile memory, this is interpreted as wherein the locating the log in volatile memory on the secondary server facilitates recovery of the file system operation without adding delay to normal file system operations due to writes to non-volatile storage (See Frey, Col. 3, lines 31-32 and Col. 5, lines 14-16).

The Applicant argues that Frey and Flemming do not teach performing only those file operations in this log file, i.e., only those file operations that are stored in the volatile memory of the second server. The Examiner respectfully disagrees. Frey teaches a recovery procedure that involves reading the log file, this is interpreted as upon a subsequent computer system startup examining the log within the log device (See Frey, Col. 9, lines 38-39). Frey also teaches the log file being used to reconstruct the system and all volatile memory which contains log entries is written to disk and into the log file, this is interpreted as replaying any file system operations from the log that have not

been committed to non-volatile storage (See Frey, Col. 5, lines 4- 7 and Col. 9, lines 50-52).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., performing only those file operations in this log file., i.e. only those file operations that are stored in the volatile memory of the second server) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Manoskey whose telephone number is (571) 272-3648. The examiner can normally be reached on Mon.-Fri. (7:30am to 4pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on (571) 272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JDM
January 4, 2007